

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
23 December 2004 (23.12.2004)

PCT

(10) International Publication Number  
**WO 2004/111054 A1**

(51) International Patent Classification<sup>7</sup>: **C07D 487/04**,  
519/00, A61K 31/519, A61P 29/00, 37/00

(74) Agent: **KUSAMA, Osamu**; KUSAMA PATENT  
OFFICE, 7F, Iwata Bldg., 5-12, Iidabashi 4-chome, Chi-  
oda-ku, Tokyo, 1020072 (JP).

(21) International Application Number:  
PCT/JP2004/008643

(22) International Filing Date: 11 June 2004 (11.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2003-170094 13 June 2003 (13.06.2003) JP

(81) Designated States (*unless otherwise indicated, for every  
kind of national protection available*): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SI, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

(71) Applicants (*for all designated States except US*): **DAI-  
ICHI SUNTORY PHARMA CO., LTD.** [JP/JP]; 7-2,  
Kojimachi 5-chome, Chiyoda-ku, Tokyo, 1028530 (JP).  
**DAIICHI SUNTORY BIOMEDICAL RESEARCH  
CO., LTD.** [JP/JP]; 1-1, Wakayamadai 1-chome, Shi-  
mamoto-cho, Mishima-gun, Osaka, 6188513 (JP).

(84) Designated States (*unless otherwise indicated, for every  
kind of regional protection available*): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SI, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,  
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

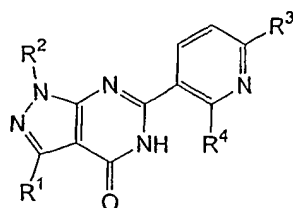
(75) Inventors/Applicants (*for US only*): **INOUE, Hidekazu**  
[JP/JP]; 18-5-207, Aoba 1-chome, Shimamoto-cho,  
Mishima-gun, Osaka, 6180015 (JP). **MURAFUJI, Hide-  
nobu** [JP/JP]; 9-14-303, Masago 2-chome, Ibaraki-shi, Os-  
aka, 5670851 (JP). **HAYASHI, Yasuharu** [JP/JP]; 9-5-803,  
Yamazaki 1-chome, Shimamoto-cho, Mishima-gun, Os-  
aka, 6180001 (JP).

Published:

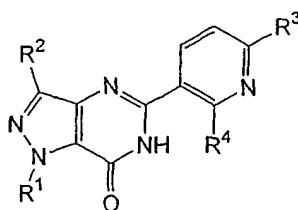
— with international search report

*For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.*

(54) Title: PYRIDINYLPYRAZOLOPYRIMIDINONE DERIVATIVES AS PDE 7 INHIBITORS



(IA)



(IB)

(57) Abstract: To provide the compounds inhibiting  
PDE 7 selectively, and therefore, enhance cellular  
cAMP level. Consequently, the compound is useful  
for treating various kinds of disease such as allergic  
disease, inflammatory disease or immunologic disease.  
The compound is pyridinylpyrazolopyrimidinone  
compound represented by the following formula (IA)  
or (IB): especially, R<sup>1</sup> is cyclohexyl or cycloheptyl  
group, R<sup>2</sup> is methyl; R<sup>3</sup> is a group: -NR<sup>5</sup>R<sup>6</sup> or  
-S(O)<sub>0-2</sub>R<sup>8</sup>; hydrogen atom; nitro group; cyano group;  
a halogen atom; heteroaryl group; and R<sup>4</sup> is methoxy

or ethoxy group.